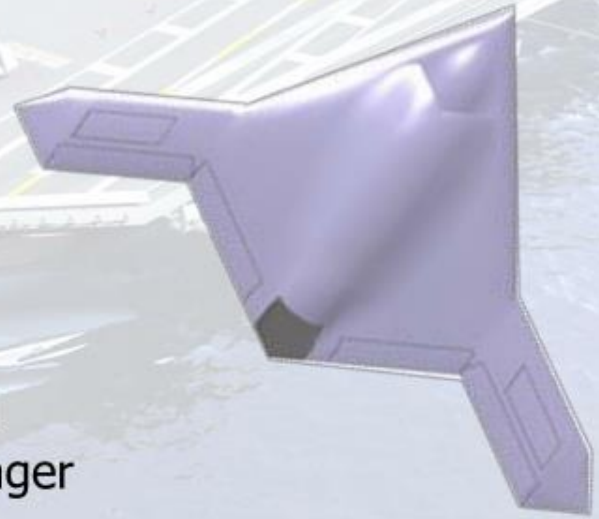
Navy Unmanned Combat Air System Advanced Development Program Office (Navy UCAS ADPO)

Program Brief to
AUVSI Seafarer Chapter
23 October 2007



CAPT Rich Brasel, USN
Navy UCAS Program Manager

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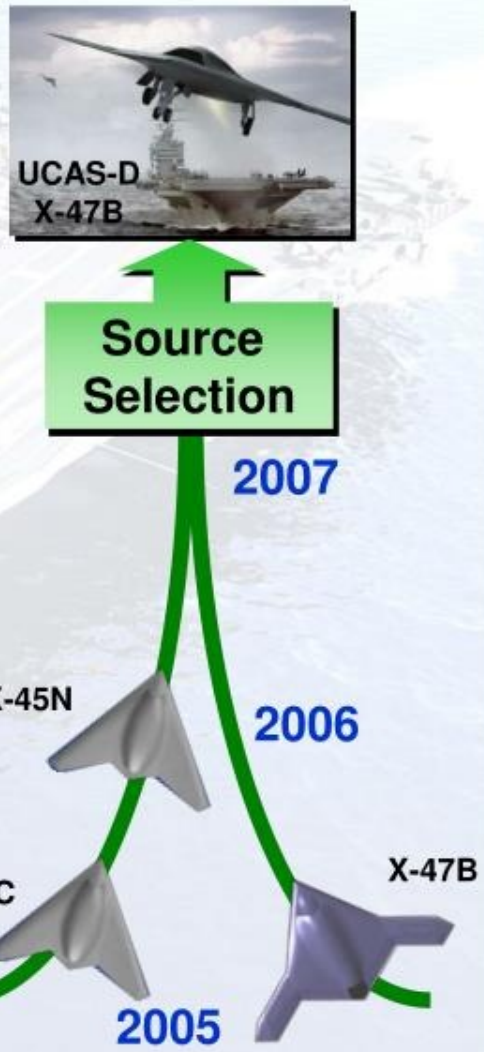
Introduction

- **J-UCAS Transition from DARPA to USAF ASC – Nov 05**
  - X-45, X-47 and CST Program Offices
- **PDM III – Dec 05**
  - Recommended Termination of J-UCAS Program
  - Separate funding between USAF and Navy Programs
- **OSD AT&L EXCOM Memorandum - 21 Feb 06**
  - ✓ Terminate or adjust COS / CST programs
  - ✓ Modify current air vehicle OTAs
    - ✓ Down-scope Boeing and NGC OTA Contracts to CV Only Path
  - ✓ Transition J-UCAS Program to Navy UCAS
  - ✓ Fund jointly AAR
  - ✓ Continue Project Churchill
  - ✓ Transfer USAF special access data and assets as required to Navy UCAS Program



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Navy UCAS Program Objectives

- Demonstrate critical technologies for a Carrier Suitable, Low Observable (LO) Air Vehicle in a relevant environment (TRL-6)
  - Carrier Control Area (CCA) Operations
  - Catapult Launch and Departure
  - Recovery including Approach, Arrested Landing, Wave-off and Bolter
- Continue maturation of other critical technologies to support CV-based UCAS
  - Technology maturation strategy capitalizes on DoD investments
  - Propulsion, LO materials in shipboard environment, ad hoc networking, autonomy
- Develop acquisition strategy and concepts that meet future recapitalization requirements

UCAS-D Critical Step Toward F/A-XX

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UCAS-D Program Contract (X-47B)

- **Contract to NGC Awarded 1 Aug 07**:
  - Non-recurring engineering, hardware, and software associated with design, development, integration, test and demonstration of two unmanned combat air system
  - Two X-47B A/V, one MCE-CV, one Sheltered MCE, two MTCC, peculiar support equipment & specs
- **Major Subcontractors**:
  - Lockheed Martin (4%): Arresting Hook, Control Surfaces & Edge, Palmdale, CA
  - Pratt and Whitney Propulsion (7%): F100 Engine, Hartford, CT
  - GKN (2%): Skins, frames & fuselage, St Louis, MO
- **Post-Award Conference NGC Palmdale, CA 11-13 Sep**
- **Period of Performance Aug 07 – Sep 13**
- **Integrated Baseline Review, Feb 08**
- **(Delta) Critical Design Review, Aug 08**
- **First Flight Nov 09 at Edwards Air Force Base**
- **Initial Carrier Arrested Landings Nov 11 aboard CVN-75**

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UCAS-D
Performance Specification Drivers

- Relevant Air Vehicle Configuration
  - LO Relevant Planform
  - Sensor/Weapon Bay Size and Weight Provisions
- CV Ops Safety
  - Lateral Landing Area Dispersion
  - Remain Clear of the Foul Line
- P-Spec tailoring of non-mandatory requirements
- CV Ops Tech Maturation
  - Autonomous Launch, Recovery, and CCA Operations from CVN
  - Longitudinal Landing Dispersion
  - Recovery Headwind < 20 Knots
- Air Vehicle Performance
  - 90 Minute CCA Loiter Time at 150 nm
  - Eight (8) CASE III Approaches

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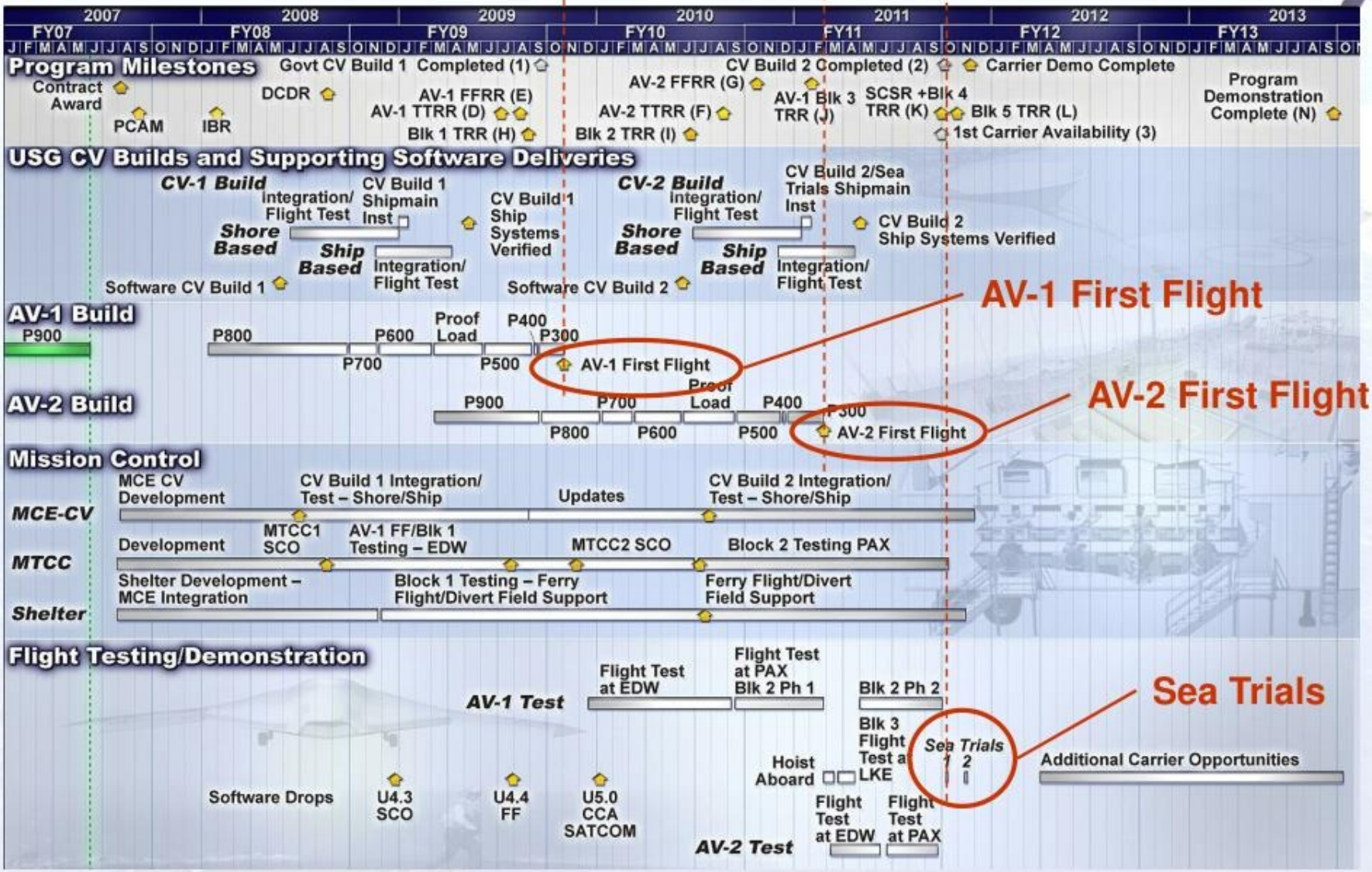
UCAS-D Program Schedule



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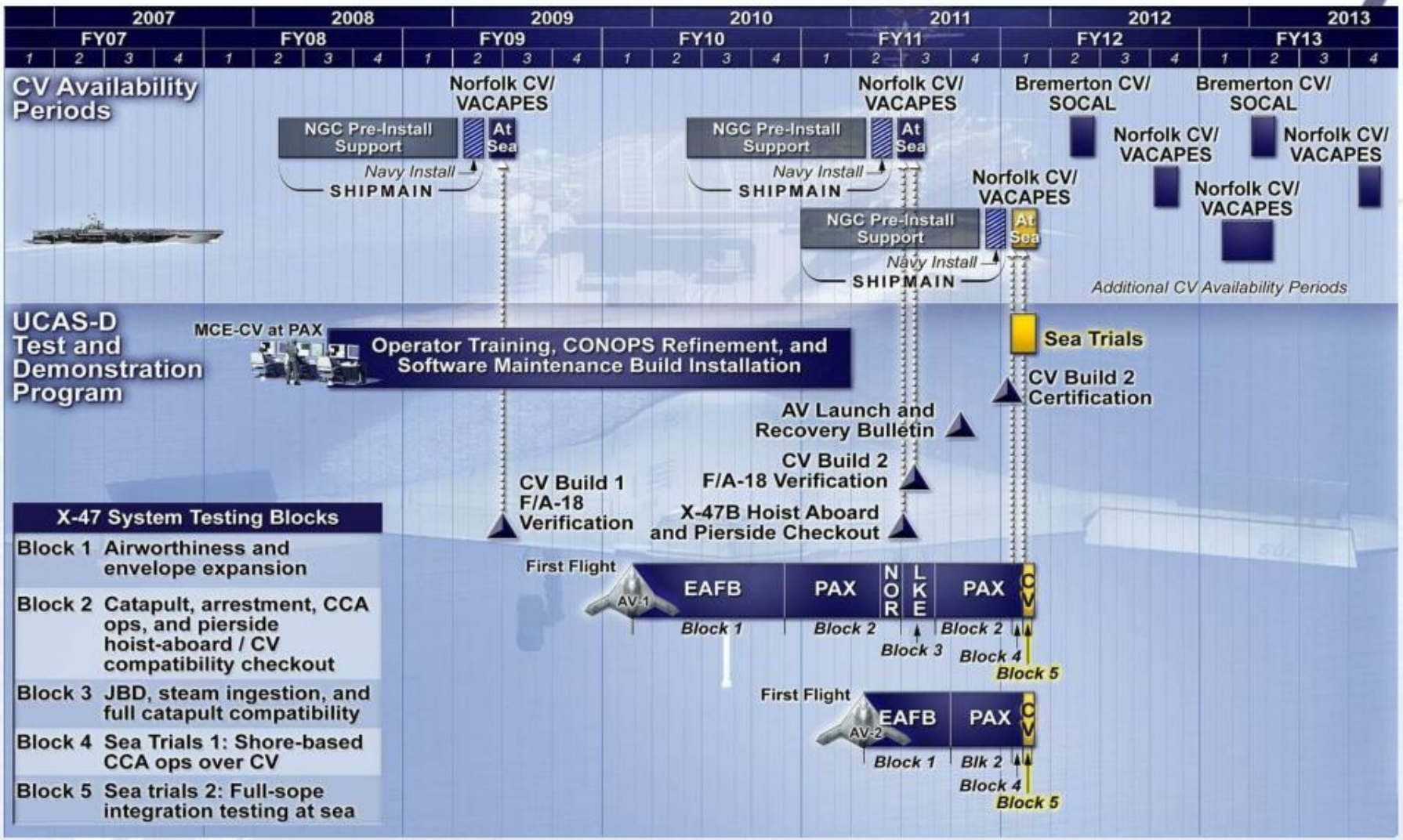
The Task Ahead: Road to the Carrier

X-47 UCAS-D Test and Demonstration Plan



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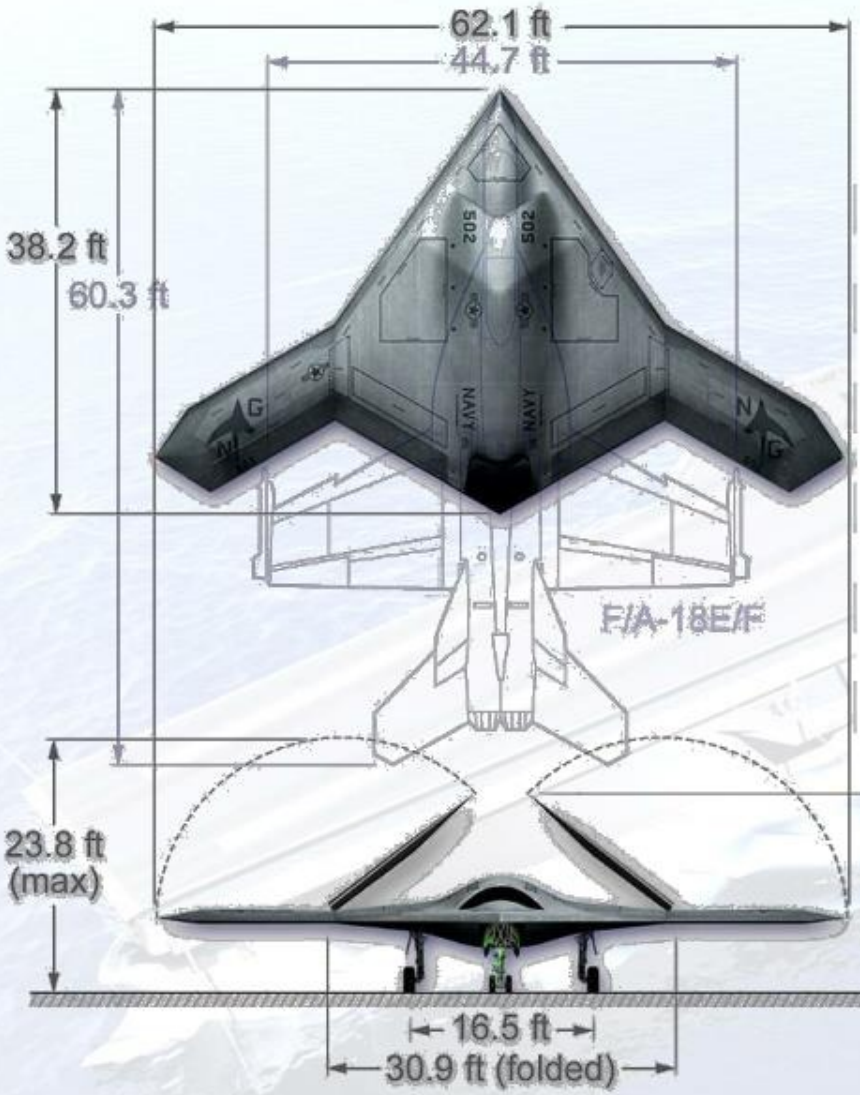
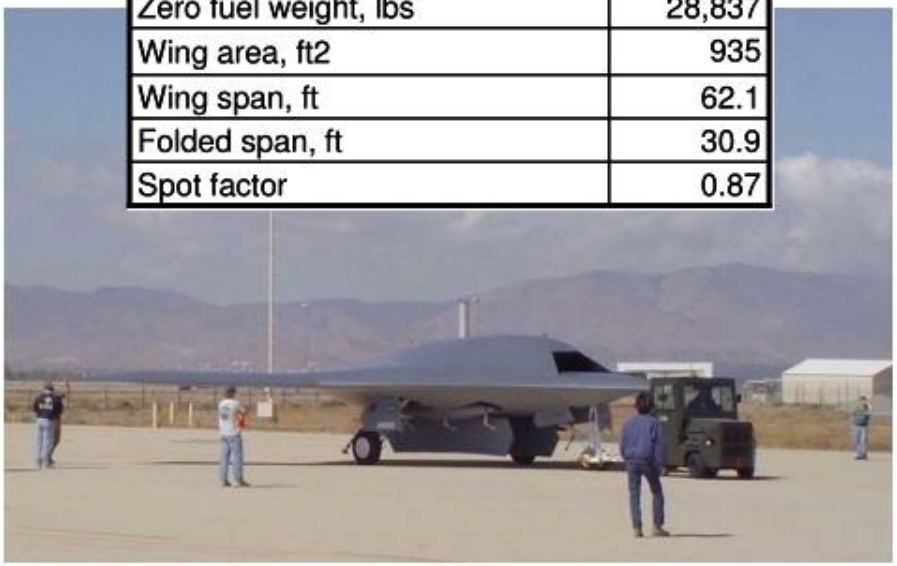
X-47B UCAS-D Air Vehicle



X-47B Characteristics	
Max launch weight, lbs	44,501
Max carrier landing weight, lbs	35,000
Zero fuel weight, lbs	28,837
Wing area, ft2	935
Wing span, ft	62.1
Folded span, ft	30.9
Spot factor	0.87



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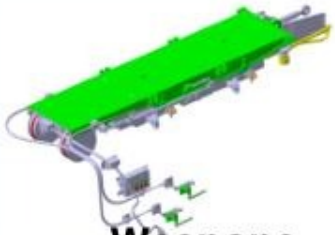
X-47B Major Subsystems / Subcontractors

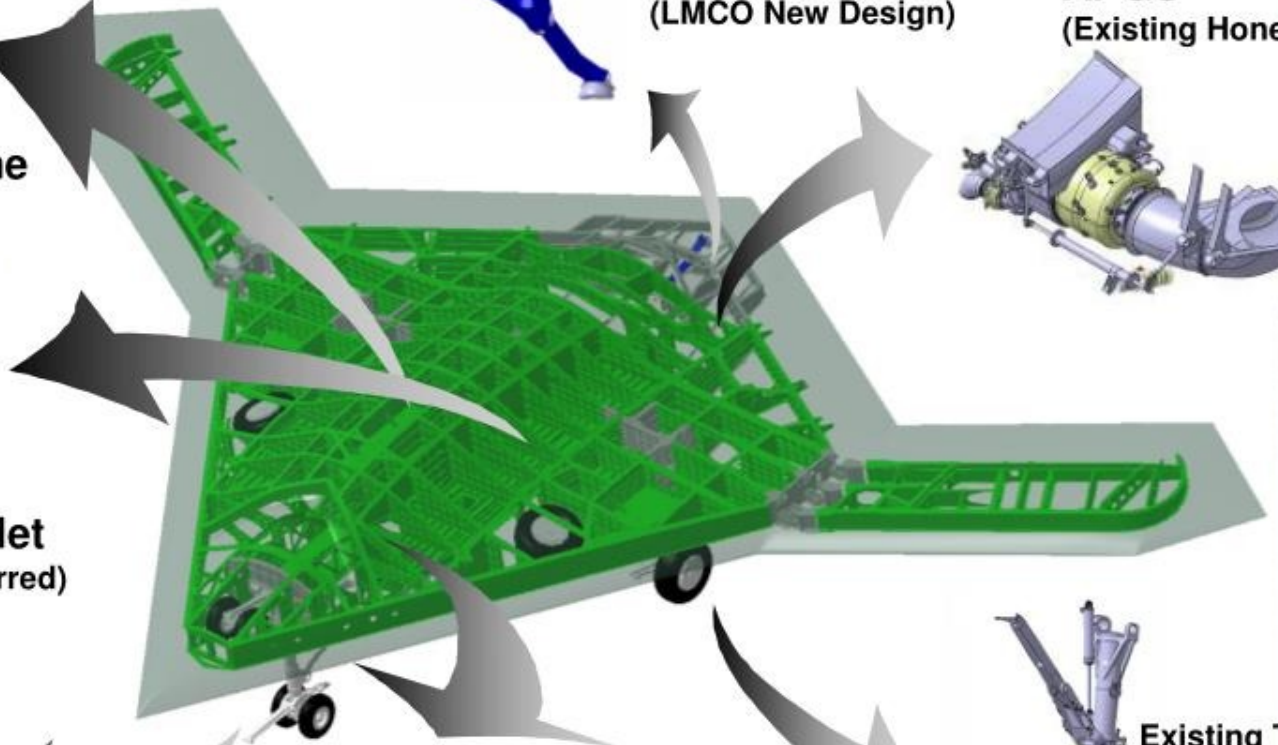
P&W F100 Engine

Arresting Hook
(LMCO New Design)

APGS
(Existing Honeywell)



Weapons
Suspension Pallet
(Breeze Eastern - Deferred)



Existing
Wheels, Tires

Nose Landing Gear
(SAMS New Design)

AMAD
(Existing Hamilton
Sundstrand)

Existing Tires,
Brakes

Main Landing Gear
(SAMS New Design)

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AV-1 Build Progress at Palmdale

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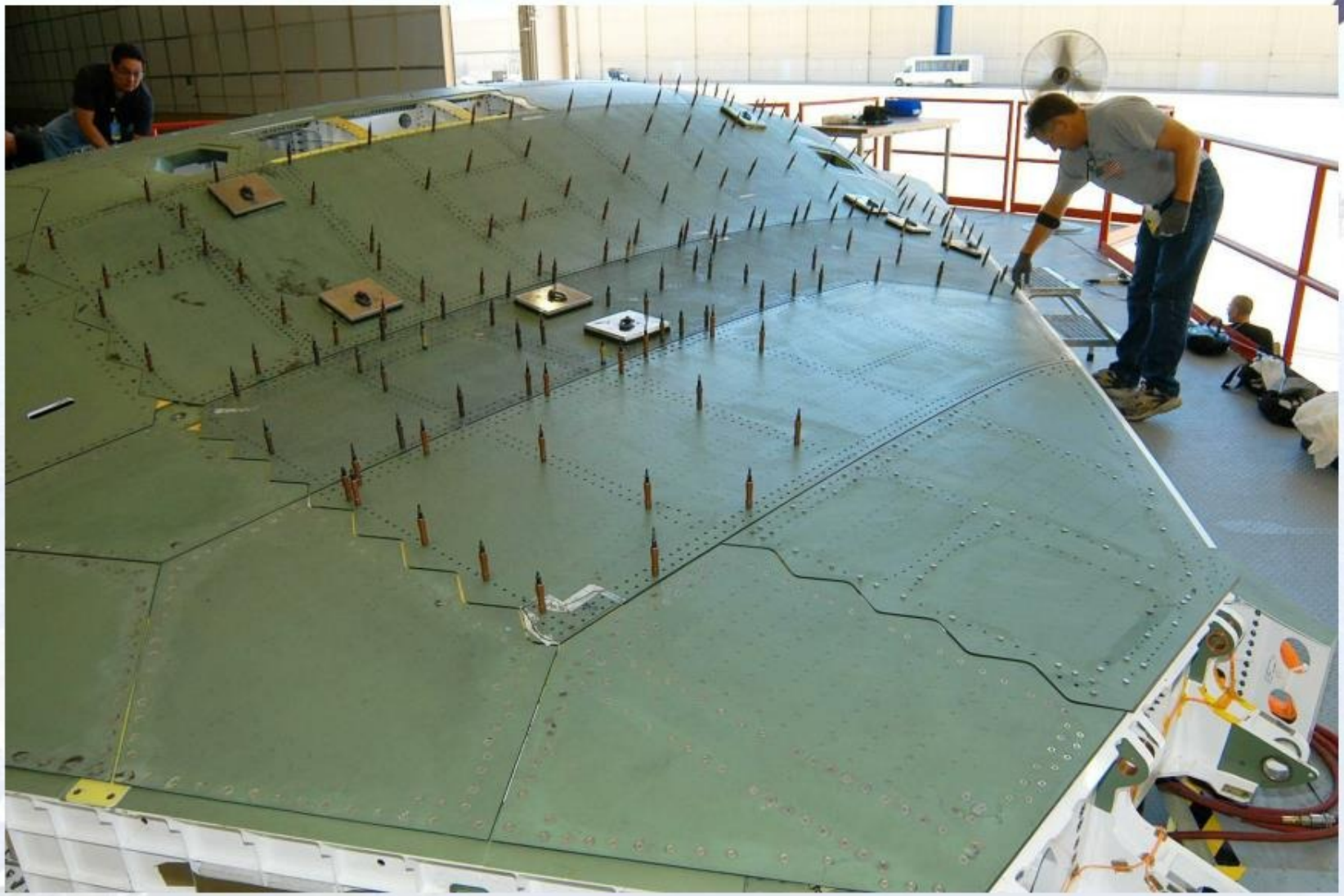
AV-1 Build Progress at Palmdale



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Ship Integration Summary

Air Vehicle Segment

NGC ICD

Support Segment

Includes Deck Handling, Maintenance and Unique Support Equipment

NGC ICD

NGC ICD

UCAS-D Shipboard Interface document describes the UCAS Ship Interfaces depicted herein.

Airborne Network & Surveillance

Includes Shore Based and Shipboard Facilities, Aircraft Launch and Recovery Equipment, Work Centers, Shipboard Equipment and Common Support Equipment

Mission Control Segment

Local Network & Voice Comms

Including Mission Planning, Mission Control and Related Functions

Carrier Segment

NAVAIR

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Ship Integration Product Teams

- The IPT provides the CV-based segment of N-UCAS. Products include:
  - Matured CV integration technologies
  - Modifications to ship systems and spaces
  - Execution of ship integration processes (e.g. SHIPMAIN)
  - Definition and control of ship interfaces

Build 1 Team Lead
Howard McGrath (ARINC)

Navy (Pax)
L-3 Comm
ARINC
EMA

WBS 2300 Internal Interfaces

LSODS Team Lead
Ralph Smith (N)

IFLOLS Team Lead
Mitchell Friedman

Navy (Lke)

ATC Console Team Lead
Mike Cohn (N)

Navy (Pax)
Mantech

ADMACS/ISIS/PFDS
Team Lead
Michael Jones (N)

Navy (Lke)

SATCC Team Lead
Cary Butterworth (N)

Navy (Chasn)
Gryphon

WBS 2200 External Interfaces

Ship Int Proc Team Lead
Mike Kosh (N)

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PGPS Team Lead
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L-3 Comm
BAE
SNC
Honeywell

ANW Team Lead
Frank Allen (N)

Rockwell
BAE

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Summary

- Cost, Schedule, Performance – On track
- Air Vehicle and Air/Ship integration efforts fully integrated
- Matures technology for CV suitability of an LO Planform
  - Obtain TRL 6
  - Identifies additional technology maturation efforts
  - Develops models for future design assessments
  - Supports system requirements for a future acquisition

UCAS-D Important Step Toward F/A-XX

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